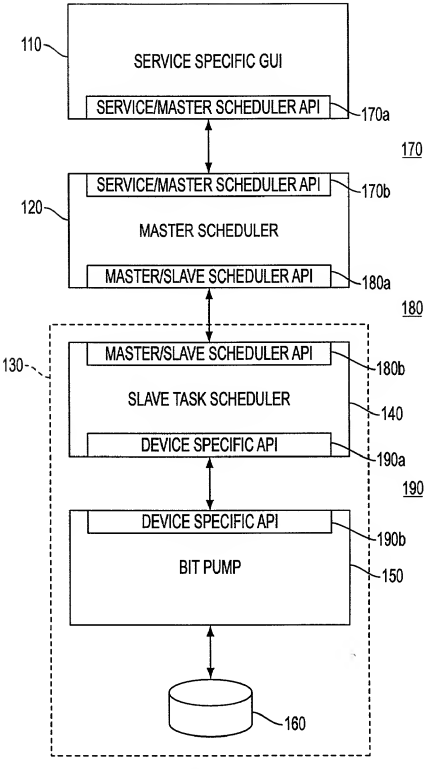

110
SERVICE SPECIFIC GUI
SERVICE/MASTER SCHEDULER API
170a
170
SERVICE/MASTER SCHEDULER API
170b
120
MASTER SCHEDULER
MASTER/SLAVE SCHEDULER API
180a
180
130
MASTER/SLAVE SCHEDULER API
180b
SLAVE TASK SCHEDULER
140
DEVICE SPECIFIC API
190a
190
DEVICE SPECIFIC API
190b
BIT PUMP
150
160

FIG. 1

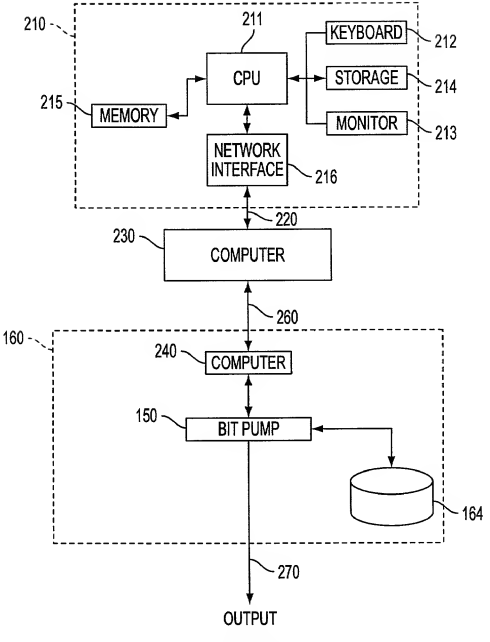

210
211
KEYBOARD
212
CPU
STORAGE
214
215
MEMORY
MONITOR
213
NETWORK INTERFACE
216
220
230
COMPUTER
260
160
240
COMPUTER
150
BIT PUMP
164
270
OUTPUT

FIG. 2

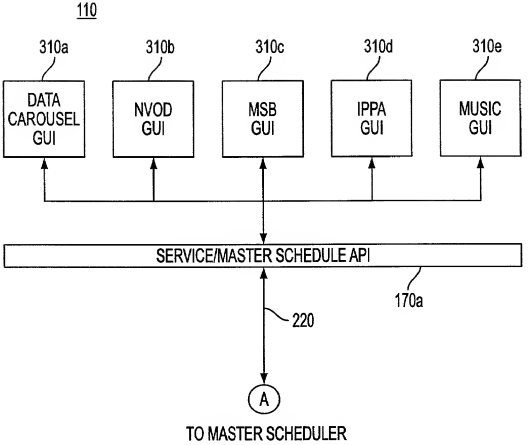

110
310a
310b
310c
310d
310e
DATA CAROUSEL GUI
NVOD GUI
MSB GUI
IPPA GUI
MUSIC GUI
SERVICE/MASTER SCHEDULE API
170a
220
A
TO MASTER SCHEDULER

FIG. 3A

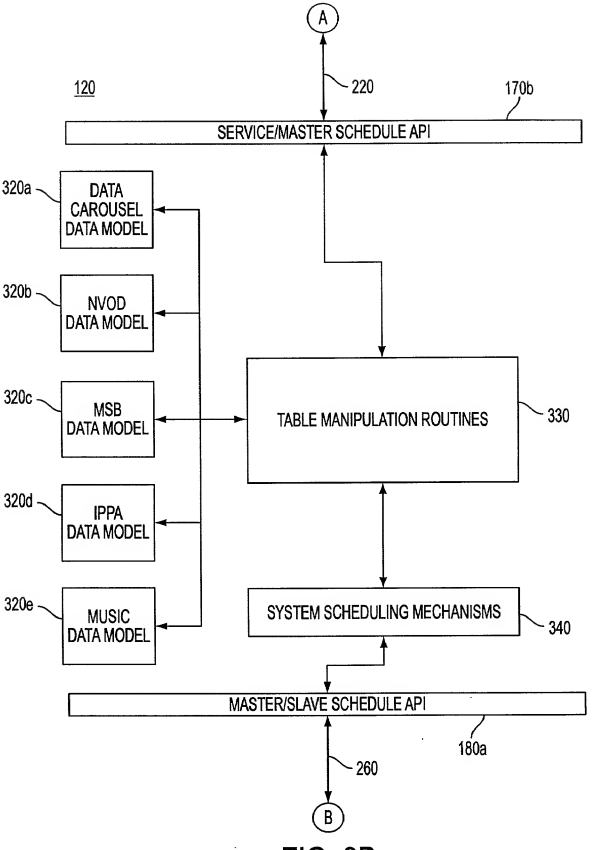

A
120
220
170b
SERVICE/MASTER SCHEDULE API
320a
DATA CAROUSEL DATA MODEL
320b
NVOD DATA MODEL
320c
MSB DATA MODEL
320d
IPPA DATA MODEL
320e
MUSIC DATA MODEL
TABLE MANIPULATION ROUTINES
330
SYSTEM SCHEDULING MECHANISMS
340
MASTER/SLAVE SCHEDULE API
180a
260
B

FIG. 3B

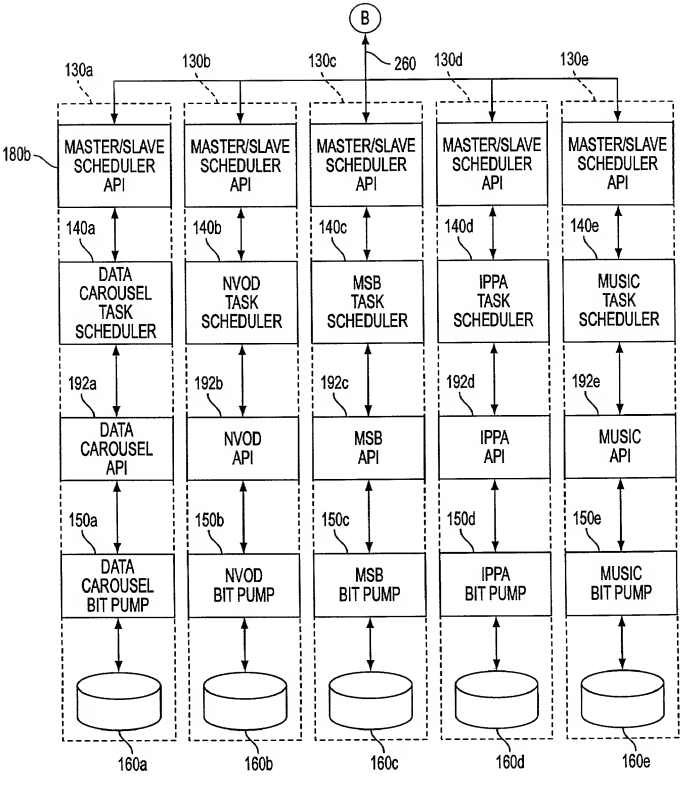

B
260
130a
130b
130c
130d
130e
180b
MASTER/SLAVE SCHEDULER API
140a
DATA CAROUSEL TASK SCHEDULER
140b
NVOD TASK SCHEDULER
140c
MSB TASK SCHEDULER
140d
IPPA TASK SCHEDULER
140e
MUSIC TASK SCHEDULER
192a
DATA CAROUSEL API
192b
NVOD API
192c
MSB API
192d
IPPA API
192e
MUSIC API
150a
DATA CAROUSEL BIT PUMP
150b
NVOD BIT PUMP
150c
MSB BIT PUMP
150d
IPPA BIT PUMP
150e
MUSIC BIT PUMP
160a
160b
160c
160d
160e

FIG. 3C

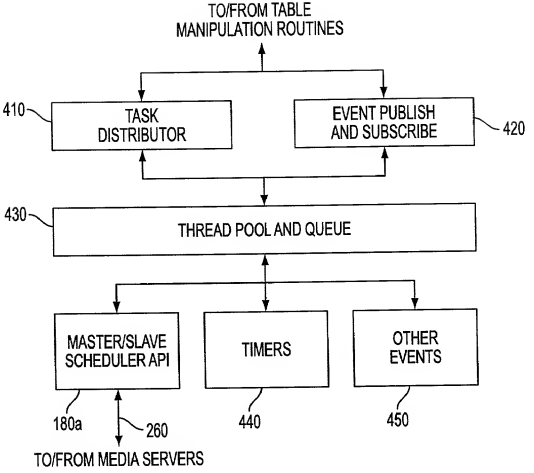

TO/FROM TABLE
MANIPULATION ROUTINES
410
TASK
DISTRIBUTOR
EVENT PUBLISH
AND SUBSCRIBE
420
430
THREAD POOL AND QUEUE
MASTER/SLAVE
SCHEDULER API
TIMERS
OTHER
EVENTS
180a
260
440
450
TO/FROM MEDIA SERVERS

FIG. 4A

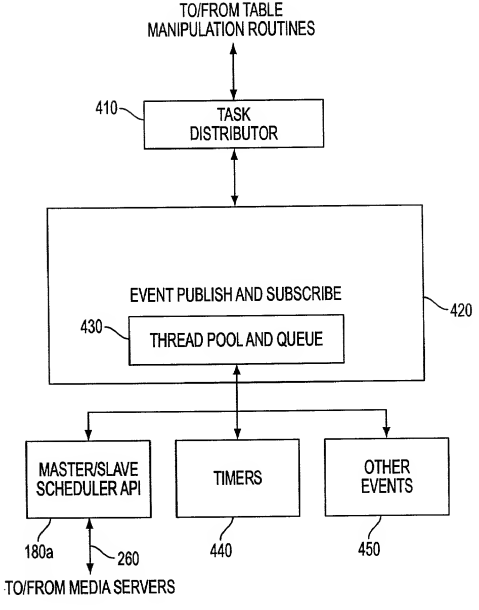

TO/FROM TABLE MANIPULATION ROUTINES
410
TASK DISTRIBUTOR
EVENT PUBLISH AND SUBSCRIBE
420
430
THREAD POOL AND QUEUE
MASTER/SLAVE SCHEDULER API
TIMERS
OTHER EVENTS
180a
260
440
450
TO/FROM MEDIA SERVERS

FIG. 4B

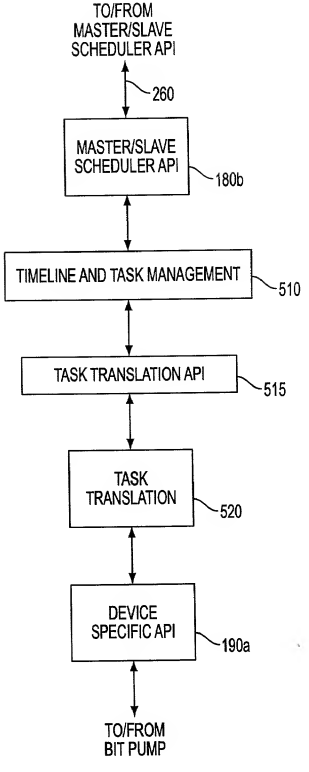

TO/FROM
MASTER/SLAVE
SCHEDULER API
260
MASTER/SLAVE
SCHEDULER API
180b
TIMELINE AND TASK MANAGEMENT
510
TASK TRANSLATION API
515
TASK
TRANSLATION
520
DEVICE
SPECIFIC API
190a
TO/FROM
BIT PUMP

FIG. 5

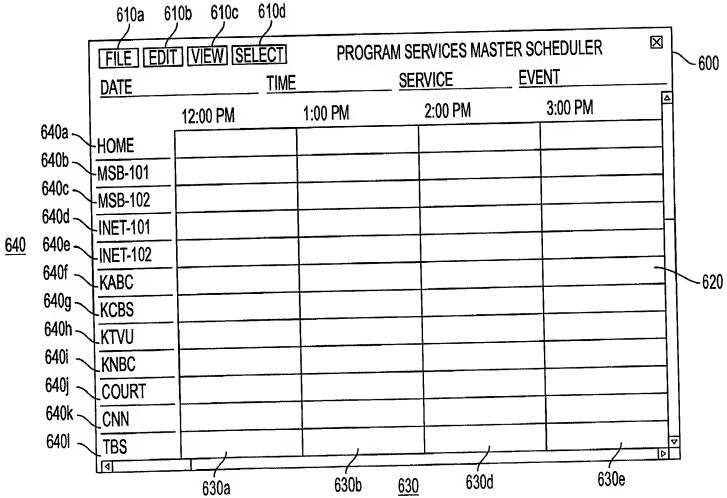

610a
610b
610c
610d
FILE
EDIT
VIEW
SELECT
PROGRAM SERVICES MASTER SCHEDULER
600
DATE
TIME
SERVICE
EVENT
12:00 PM
1:00 PM
2:00 PM
3:00 PM
640
640a HOME
640b MSB-101
640c MSB-102
640d INET-101
640e INET-102
640f KABC
640g KCBS
640h KTVU
640i KNBC
640j COURT
640k CNN
640l TBS
620
630a
630b
630
630d
630e

FIG. 6

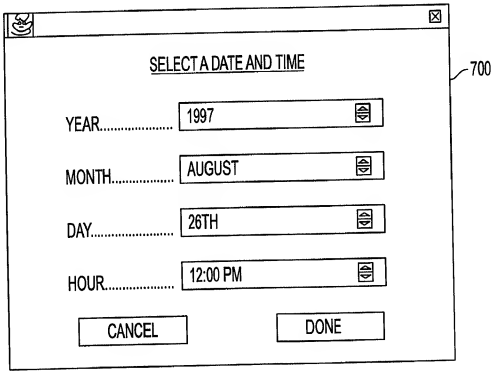

SELECT A DATE AND TIME
700
YEAR..... 1997
MONTH..... AUGUST
DAY..... 26TH
HOUR..... 12:00 PM
CANCEL
DONE

FIG. 7

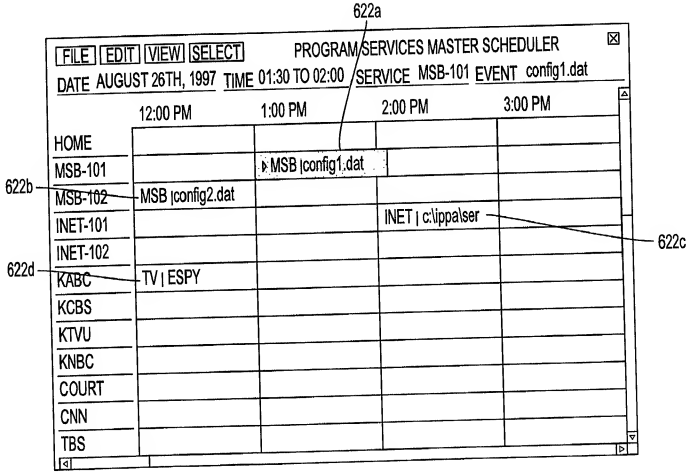

622a
FILE EDIT VIEW SELECT
PROGRAM SERVICES MASTER SCHEDULER
DATE AUGUST 26TH, 1997 TIME 01:30 TO 02:00 SERVICE MSB-101 EVENT config1.dat
12:00 PM
1:00 PM
2:00 PM
3:00 PM
HOME
MSB-101
MSB-102
INET-101
INET-102
KABC
KCBS
KTVU
KNBC
COURT
CNN
TBS
MSB |config1.dat
MSB |config2.dat
INET | c:\ippa\ser
TV | ESPY
622b
622c
622d

FIG. 8

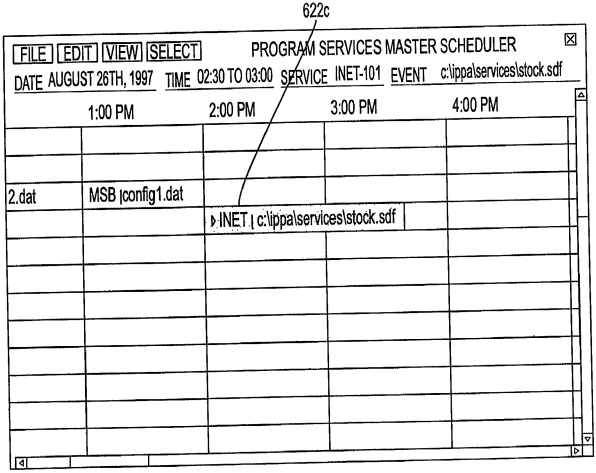

622c
FILE
EDIT
VIEW
SELECT
PROGRAM SERVICES MASTER SCHEDULER
DATE AUGUST 26TH, 1997
TIME 02:30 TO 03:00
SERVICE INET-101
EVENT c:\ippa\services\stock.sdf
1:00 PM
2:00 PM
3:00 PM
4:00 PM
2.dat
MSB |config1.dat
INET | c:\ippa\services\stock.sdf

FIG. 9

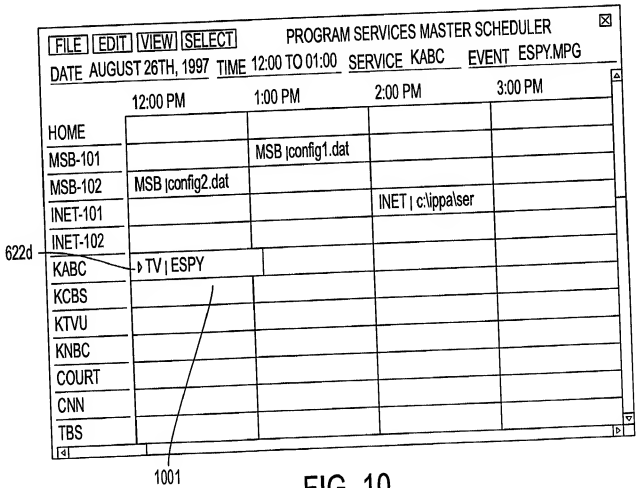

FILE
EDIT
VIEW
SELECT
PROGRAM SERVICES MASTER SCHEDULER
DATE AUGUST 26TH, 1997
TIME 12:00 TO 01:00
SERVICE KABC
EVENT ESPY.MPG
12:00 PM
1:00 PM
2:00 PM
3:00 PM
HOME
MSB-101
MSB-102
INET-101
INET-102
KABC
KCBS
KTVU
KNBC
COURT
CNN
TBS
MSB |config1.dat
MSB |config2.dat
INET | c:\ippa\ser
TV | ESPY
622d
1001

FIG. 10

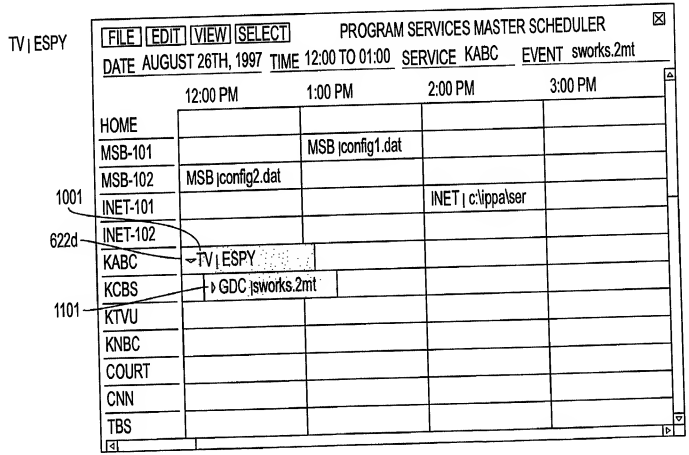

TV | ESPY
FILE
EDIT
VIEW
SELECT
PROGRAM SERVICES MASTER SCHEDULER
DATE AUGUST 26TH, 1997
TIME 12:00 TO 01:00
SERVICE KABC
EVENT sworks.2mt
12:00 PM
1:00 PM
2:00 PM
3:00 PM
HOME
MSB-101
MSB-102
INET-101
INET-102
KABC
KCBS
KTVU
KNBC
COURT
CNN
TBS
MSB |config1.dat
MSB |config2.dat
INET | c:\lippa\ser
TV | ESPY
GDC |sworks.2mt
1001
622d
1101

FIG. 11

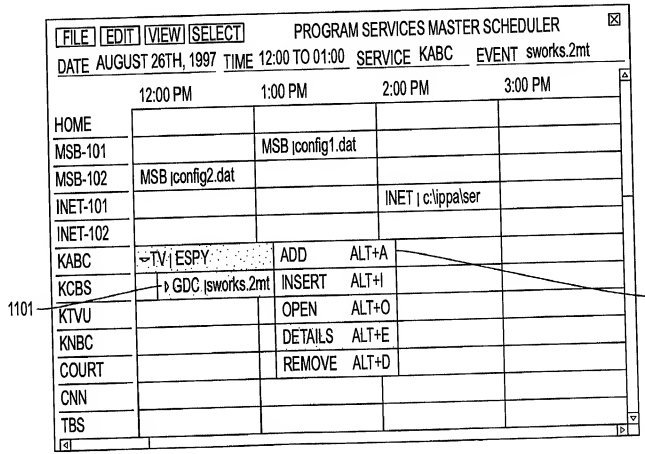

FILE
EDIT
VIEW
SELECT
PROGRAM SERVICES MASTER SCHEDULER
DATE AUGUST 26TH, 1997
TIME 12:00 TO 01:00
SERVICE KABC
EVENT sworks.2mt
12:00 PM
1:00 PM
2:00 PM
3:00 PM
HOME
MSB-101
MSB-102
INET-101
INET-102
KABC
KCBS
KTVU
KNBC
COURT
CNN
TBS
MSB |config1.dat
MSB |config2.dat
INET | c:\ippa\ser
TV | ESPY
GDC |sworks.2mt
ADD ALT+A
INSERT ALT+I
OPEN ALT+O
DETAILS ALT+E
REMOVE ALT+D
1101
1201

FIG. 12

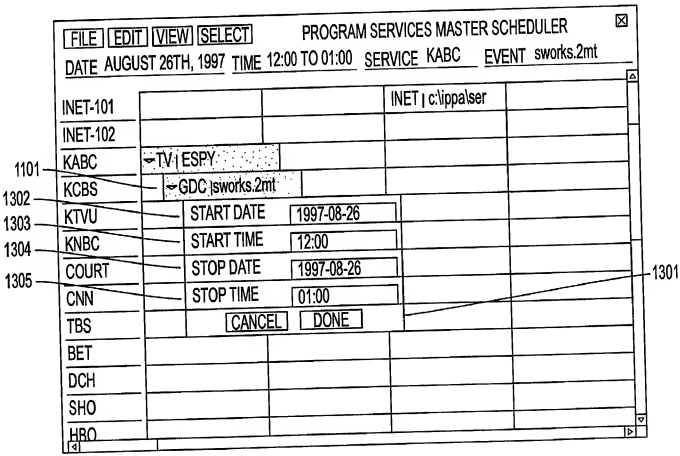

FILE
EDIT
VIEW
SELECT
PROGRAM SERVICES MASTER SCHEDULER
DATE AUGUST 26TH, 1997
TIME 12:00 TO 01:00
SERVICE KABC
EVENT sworks.2mt
INET-101
INET-102
KABC
KCBS
KTVU
KNBC
COURT
CNN
TBS
BET
DCH
SHO
HBO
INET | c:\ippa\ser
TV | ESPY
GDC |sworks.2mt
START DATE
1997-08-26
START TIME
12:00
STOP DATE
1997-08-26
STOP TIME
01:00
CANCEL
DONE
1101
1302
1303
1304
1305
1301

FIG. 13

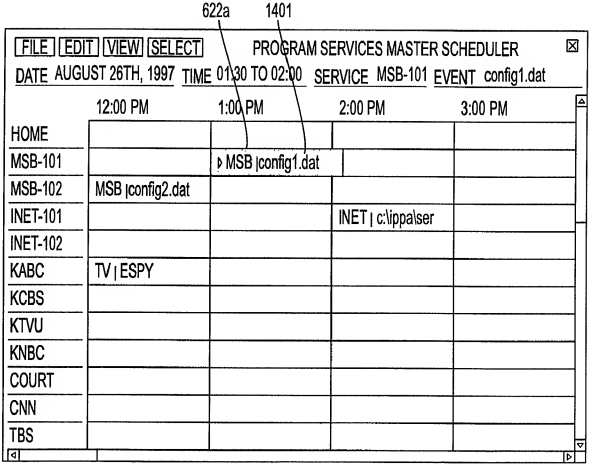

622a
1401
FILE
EDIT
VIEW
SELECT
PROGRAM SERVICES MASTER SCHEDULER
DATE AUGUST 26TH, 1997
TIME 01:30 TO 02:00
SERVICE MSB-101
EVENT config1.dat
12:00 PM
1:00 PM
2:00 PM
3:00 PM
HOME
MSB-101
MSB-102
INET-101
INET-102
KABC
KCBS
KTVU
KNBC
COURT
CNN
TBS
MSB |config1.dat
MSB |config2.dat
INET | c:\ippa\ser
TV | ESPY

FIG. 14

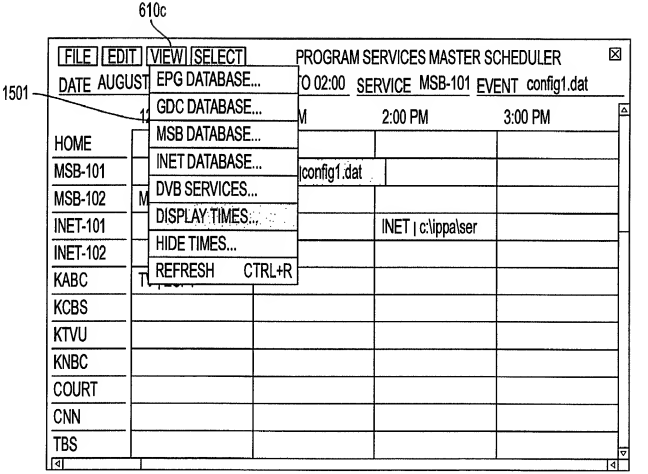

610c
1501
FILE
EDIT
VIEW
SELECT
PROGRAM SERVICES MASTER SCHEDULER
DATE AUGUST
TO 02:00
SERVICE MSB-101
EVENT config1.dat
EPG DATABASE...
GDC DATABASE...
MSB DATABASE...
INET DATABASE...
DVB SERVICES...
DISPLAY TIMES...
HIDE TIMES...
REFRESH CTRL+R
2:00 PM
3:00 PM
HOME
MSB-101
MSB-102
INET-101
INET-102
KABC
KCBS
KTVU
KNBC
COURT
CNN
TBS
config1.dat
INET | c:\ippa\ser

FIG. 15

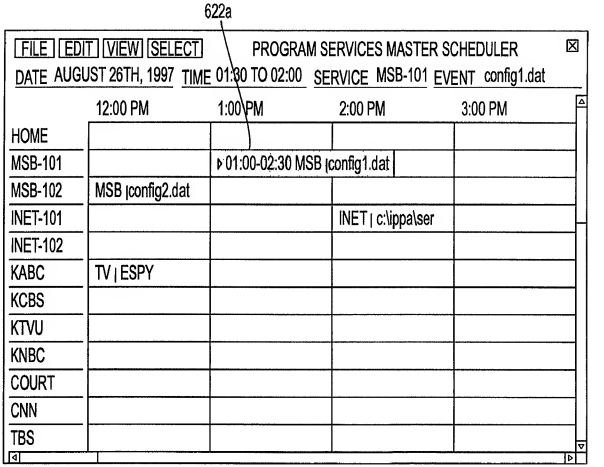

622a
FILE
EDIT
VIEW
SELECT
PROGRAM SERVICES MASTER SCHEDULER
DATE AUGUST 26TH, 1997
TIME 01:30 TO 02:00
SERVICE MSB-101
EVENT config1.dat
12:00 PM
1:00 PM
2:00 PM
3:00 PM
HOME
MSB-101
MSB-102
INET-101
INET-102
KABC
KCBS
KTVU
KNBC
COURT
CNN
TBS
01:00-02:30 MSB |config1.dat
MSB |config2.dat
INET | c:\ippa\ser
TV | ESPY

FIG. 16

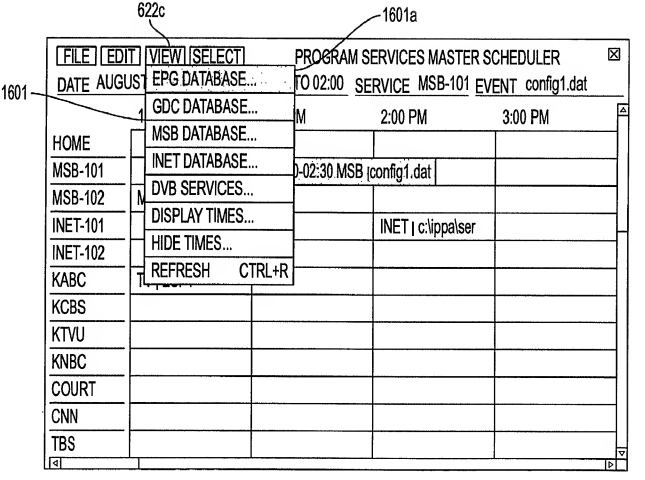

622c
1601a
1601
FILE
EDIT
VIEW
SELECT
PROGRAM SERVICES MASTER SCHEDULER
DATE AUGUST
TO 02:00
SERVICE MSB-101
EVENT config1.dat
EPG DATABASE...
GDC DATABASE...
MSB DATABASE...
INET DATABASE...
DVB SERVICES...
DISPLAY TIMES...
HIDE TIMES...
REFRESH CTRL+R
M
2:00 PM
3:00 PM
HOME
MSB-101
MSB-102
INET-101
INET-102
KABC
KCBS
KTVU
KNBC
COURT
CNN
TBS
-02:30 MSB config1.dat
INET c:\ippa\ser

FIG. 17

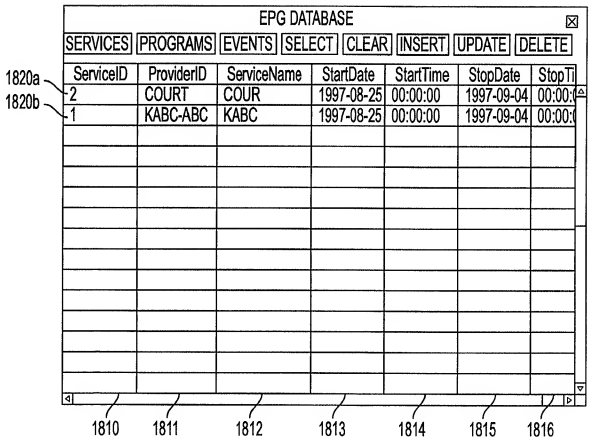

EPG DATABASE
SERVICES
PROGRAMS
EVENTS
SELECT
CLEAR
INSERT
UPDATE
DELETE
ServiceID
ProviderID
ServiceName
StartDate
StartTime
StopDate
StopTi
2
COURT
COUR
1997-08-25
00:00:00
1997-09-04
1
KABC-ABC
KABC
1997-08-25
00:00:00
1997-09-04
1820a
1820b
1810
1811
1812
1813
1814
1815
1816

FIG. 18

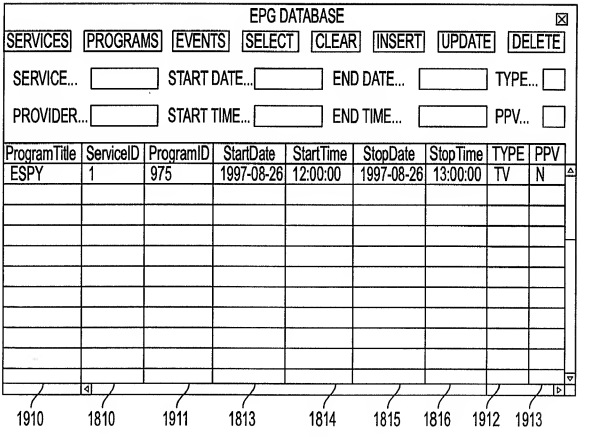

EPG DATABASE
SERVICES
PROGRAMS
EVENTS
SELECT
CLEAR
INSERT
UPDATE
DELETE
SERVICE...
START DATE...
END DATE...
TYPE...
PROVIDER...
START TIME...
END TIME...
PPV...
ProgramTitle
ServiceID
ProgramID
StartDate
StartTime
StopDate
StopTime
TYPE
PPV
ESPY
1
975
1997-08-26
12:00:00
1997-08-26
13:00:00
TV
N
1910
1810
1911
1813
1814
1815
1816
1912
1913

FIG. 19

SELECT | INSERT | UPDATE | DELETE | CLEAR | GDC DATABASE

AssetURL	ProgramID	SpoolID	Bandwidth	QueueSlot
/americast/code/input/sworks.m2t	201	1	5300000	P
/americast/code/input/ESPY.MPG	401	1	5300000	P
ESPY.MPG	402	1	10	D
sworks.2mt	403	1	10	D
ESPY.MPG	404	1	10	D
sworks.2mt	405	1	10	D
ESPY.MPG	406	1	10	D
sworks.2mt	407	1	10	D
ESPY.MPG	1004	100	10	P
ESPY.MPG	1008	100	10	P
ESPY.MPG	1032	100	10	P
dummy.xyp	1034	100	10	P
sworks.2mt	1036	100	10	P
ESPY.MPG	1056	100	10	P

2010 1911 2011 2012 2013

FIG. 20

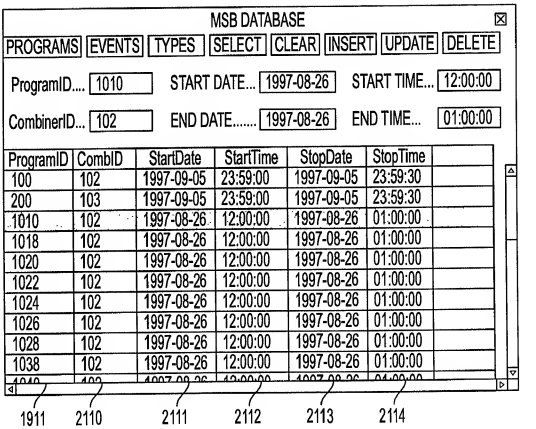

MSB DATABASE
PROGRAMS
EVENTS
TYPES
SELECT
CLEAR
INSERT
UPDATE
DELETE
ProgramID.... 1010
START DATE... 1997-08-26
START TIME... 12:00:00
CombinerID... 102
END DATE..... 1997-08-26
END TIME... 01:00:00
ProgramID | CombID | StartDate | StartTime | StopDate | StopTime
100 | 102 | 1997-09-05 | 23:59:00 | 1997-09-05 | 23:59:30
200 | 103 | 1997-09-05 | 23:59:00 | 1997-09-05 | 23:59:30
1010 | 102 | 1997-08-26 | 12:00:00 | 1997-08-26 | 01:00:00
1018 | 102 | 1997-08-26 | 12:00:00 | 1997-08-26 | 01:00:00
1020 | 102 | 1997-08-26 | 12:00:00 | 1997-08-26 | 01:00:00
1022 | 102 | 1997-08-26 | 12:00:00 | 1997-08-26 | 01:00:00
1024 | 102 | 1997-08-26 | 12:00:00 | 1997-08-26 | 01:00:00
1026 | 102 | 1997-08-26 | 12:00:00 | 1997-08-26 | 01:00:00
1028 | 102 | 1997-08-26 | 12:00:00 | 1997-08-26 | 01:00:00
1038 | 102 | 1997-08-26 | 12:00:00 | 1997-08-26 | 01:00:00
1911
2110
2111
2112
2113
2114

FIG. 21

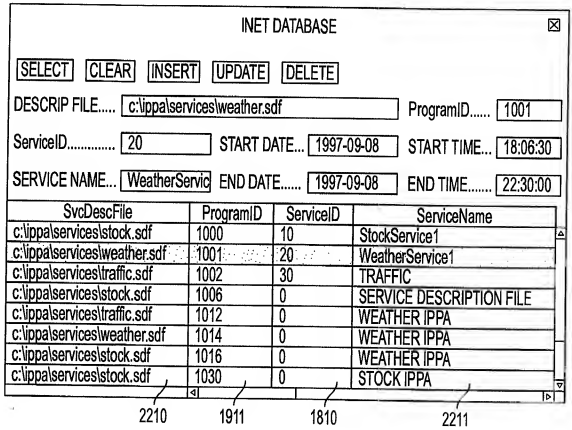

INET DATABASE
SELECT
CLEAR
INSERT
UPDATE
DELETE
DESCRIP FILE..... c:\ippa\services\weather.sdf
ProgramID..... 1001
ServiceID..... 20
START DATE... 1997-09-08
START TIME... 18:06:30
SERVICE NAME... WeatherServic
END DATE..... 1997-09-08
END TIME..... 22:30:00
SvcDescFile
ProgramID
ServiceID
ServiceName
c:\ippa\services\stock.sdf 1000 10 StockService1
c:\ippa\services\weather.sdf 1001 20 WeatherService1
c:\ippa\services\traffic.sdf 1002 30 TRAFFIC
c:\ippa\services\stock.sdf 1006 0 SERVICE DESCRIPTION FILE
c:\ippa\services\traffic.sdf 1012 0 WEATHER IPPA
c:\ippa\services\weather.sdf 1014 0 WEATHER IPPA
c:\ippa\services\stock.sdf 1016 0 WEATHER IPPA
c:\ippa\services\stock.sdf 1030 0 STOCK IPPA
2210
1911
1810
2211

FIG. 22

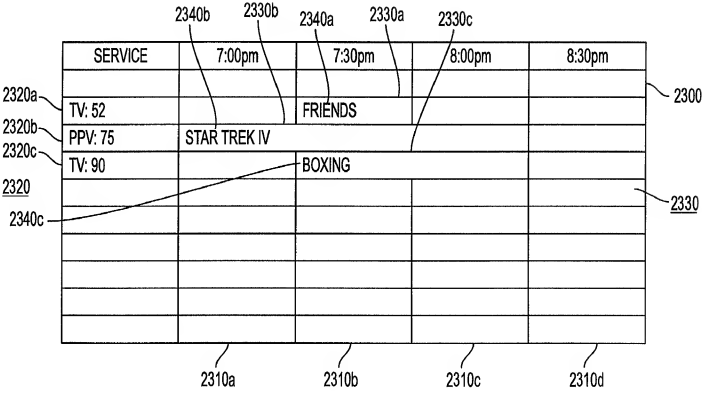

2340b
2330b
2340a
2330a
2330c
SERVICE
7:00pm
7:30pm
8:00pm
8:30pm
2320a
TV: 52
FRIENDS
2300
2320b
PPV: 75
STAR TREK IV
2320c
TV: 90
BOXING
2320
2330
2340c
2310a
2310b
2310c
2310d
2310

FIG. 23A

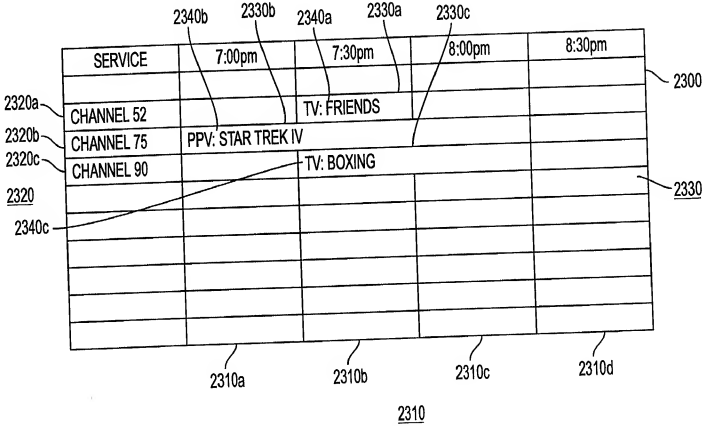

2340b
2330b
2340a
2330a
2330c
SERVICE
7:00pm
7:30pm
8:00pm
8:30pm
2300
2320a
CHANNEL 52
TV: FRIENDS
2320b
CHANNEL 75
PPV: STAR TREK IV
2320c
CHANNEL 90
TV: BOXING
2320
2330
2340c
2310a
2310b
2310c
2310d
2310

FIG. 23B

UNDER PROTECTION

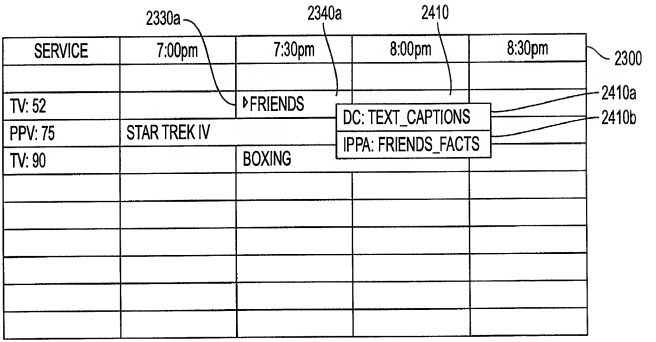


FIG. 24A

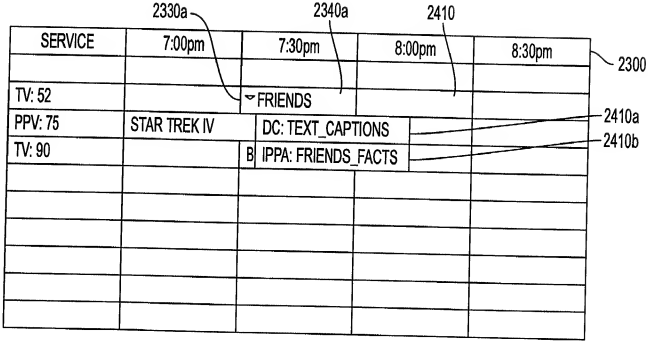

2330a
2340a
2410
SERVICE
7:00pm
7:30pm
8:00pm
8:30pm
2300
TV: 52
FRIENDS
PPV: 75
STAR TREK IV
DC: TEXT_CAPTIONS
2410a
TV: 90
B
IPPA: FRIENDS_FACTS
2410b

FIG. 24B

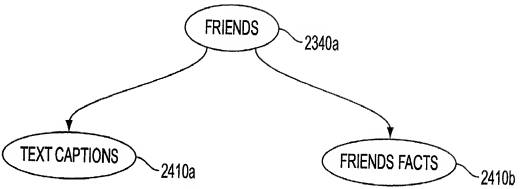


FIG. 24C

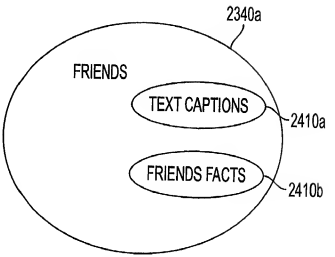


FIG. 24D

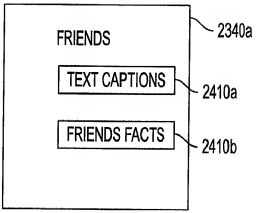


FIG. 24E

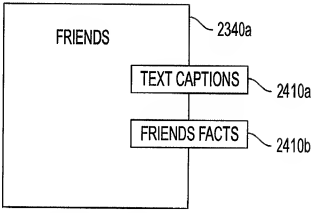


FIG. 24F

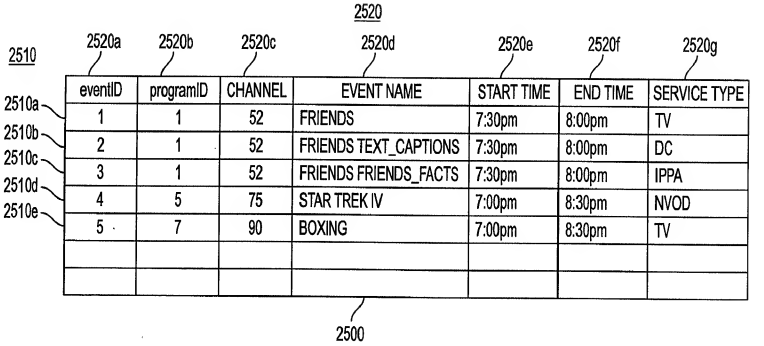

2520
2510
2520a
2520b
2520c
2520d
2520e
2520f
2520g
eventID
programID
CHANNEL
EVENT NAME
START TIME
END TIME
SERVICE TYPE
2510a
2510b
2510c
2510d
2510e
1 1 52 FRIENDS 7:30pm 8:00pm TV
2 1 52 FRIENDS TEXT_CAPTIONS 7:30pm 8:00pm DC
3 1 52 FRIENDS FRIENDS_FACTS 7:30pm 8:00pm IPPA
4 5 75 STAR TREK IV 7:00pm 8:30pm NVOD
5 7 90 BOXING 7:00pm 8:30pm TV
2500

FIG. 25

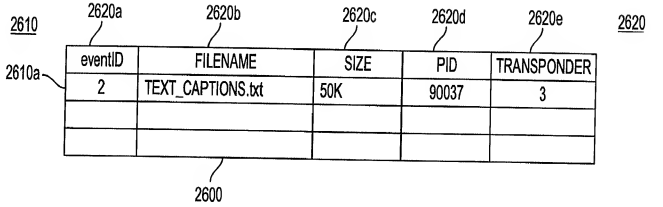

2610
2620a
2620b
2620c
2620d
2620e
2620
2610a
eventID
FILENAME
SIZE
PID
TRANSPONDER
2
TEXT_CAPTIONS.txt
50K
90037
3
2600

FIG. 26

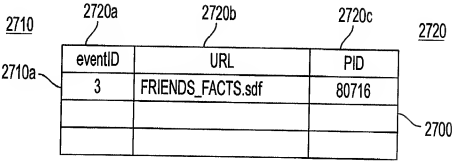

2710
2720a
2720b
2720c
2720
2710a
eventID
URL
PID
3
FRIENDS_FACTS.sdf
80716
2700

FIG. 27

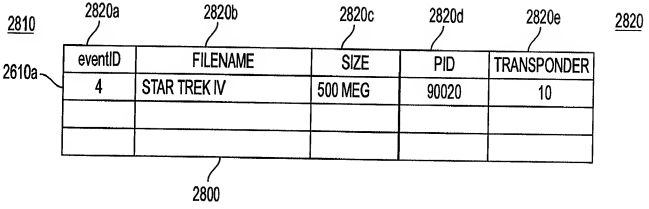

2810
2820a
2820b
2820c
2820d
2820e
2820
2610a
eventID
FILENAME
SIZE
PID
TRANSPONDER
4
STAR TREK IV
500 MEG
90020
10
2800

FIG. 28

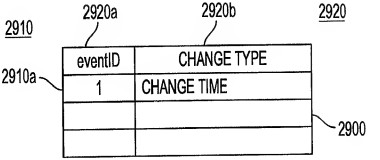

2910
2920a
2920b
2920
eventID
CHANGE TYPE
2910a
1
CHANGE TIME
2900

FIG. 29

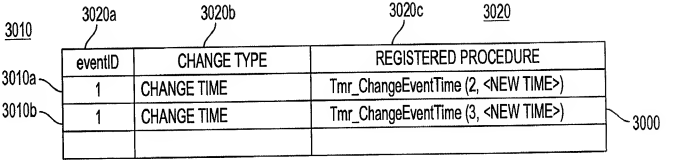

3010
3020a
3020b
3020c
3020
eventID
CHANGE TYPE
REGISTERED PROCEDURE
3010a
1
CHANGE TIME
Tmr_ChangeEventTime (2, <NEW TIME>)
3010b
1
CHANGE TIME
Tmr_ChangeEventTime (3, <NEW TIME>)
3000

FIG. 30

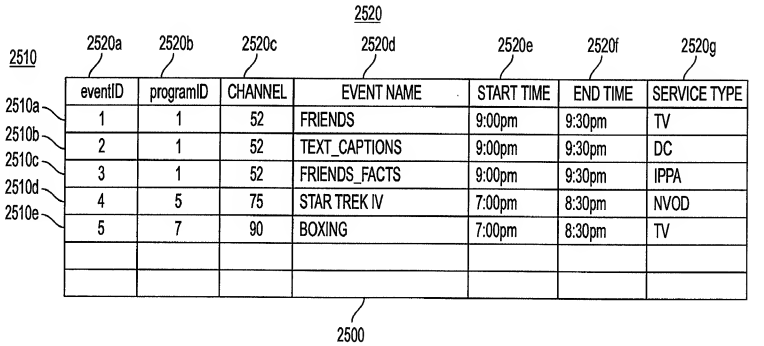

2520
2510
2520a
2520b
2520c
2520d
2520e
2520f
2520g
eventID
programID
CHANNEL
EVENT NAME
START TIME
END TIME
SERVICE TYPE
2510a
2510b
2510c
2510d
2510e
1 1 52 FRIENDS 9:00pm 9:30pm TV
2 1 52 TEXT_CAPTIONS 9:00pm 9:30pm DC
3 1 52 FRIENDS_FACTS 9:00pm 9:30pm IPPA
4 5 75 STAR TREK IV 7:00pm 8:30pm NVOD
5 7 90 BOXING 7:00pm 8:30pm TV
2500

FIG. 31

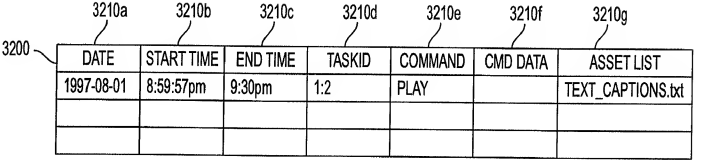


FIG. 32A

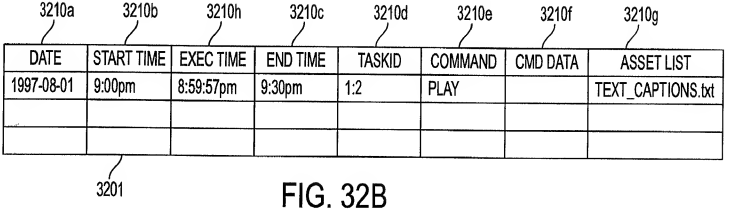
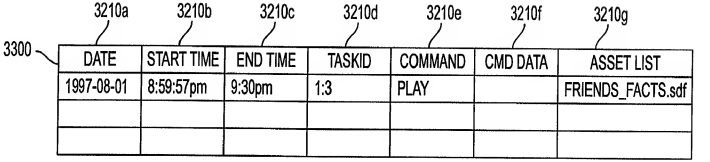
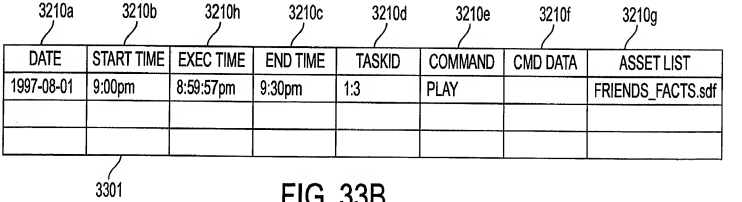


FIG. 32B



DATE	START TIME	END TIME	TASKID	COMMAND	CMD DATA	ASSET LIST
1997-08-01	8:59:57pm	9:30pm	1:3	PLAY		FRIENDS_FACTS.sdf

FIG. 33A



DATE	START TIME	EXEC TIME	END TIME	TASKID	COMMAND	CMD DATA	ASSET LIST
1997-08-01	9:00pm	8:59:57pm	9:30pm	1:3	PLAY		FRIENDS_FACTS.sdf

FIG. 33B

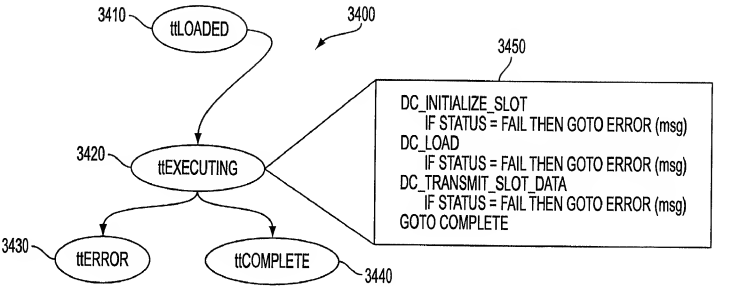

3410
ttLOADED
3400
3450
DC_INITIALIZE_SLOT
IF STATUS = FAIL THEN GOTO ERROR (msg)
DC_LOAD
IF STATUS = FAIL THEN GOTO ERROR (msg)
DC_TRANSMIT_SLOT_DATA
IF STATUS = FAIL THEN GOTO ERROR (msg)
GOTO COMPLETE
3420
ttEXECUTING
3430
ttERROR
ttCOMPLETE
3440

FIG. 34